



South Carolina Conservation Bank

Conservation Priority Mapping

August 31, 2022

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## **Introduction**

The South Carolina Conservation Bank (SCCB) has been tasked with developing statewide conservation priority maps that will be submitted to the South Carolina General Assembly as identified in South Carolina House Bill 4727 Section 48-59-50, B(5):

*“(5) develop conservation criteria to be used, in addition to the criteria set forth in Section 48-59-70(D), that advance and support federal, state, and local conservation goals, plans, objectives, and initiatives. In order to assist in the development of conservation criteria, the bank must coordinate with the appropriate groups to integrate the goals, plans, objectives, and initiatives, as well as land use patterns, into a statewide conservation map. The map must be created by July 1, 2019, and the criteria and map must be reviewed no less than every ten years thereafter. The criteria list and map must be submitted to the General Assembly annually.”*

In June of 2019, the first statewide conservation priority maps were produced by the South Carolina Department of Natural Resources for the South Carolina Conservation Bank. They consisted of five sub-maps (public access, ecological conservation priorities, cultural resources, private working lands, and water resources), and a final conservation priority model. The priority maps were updated in May of 2022 to consist of six sub-maps for different conservation categories and a final conservation priority model map. The six sub-maps include: conservation corridors, ecological conservation priorities, sustainable forestry and agriculture, water resources, proximity to urban interface, and public benefit. Each of these sub-maps include one or more data layer(s) representative of the conservation category.

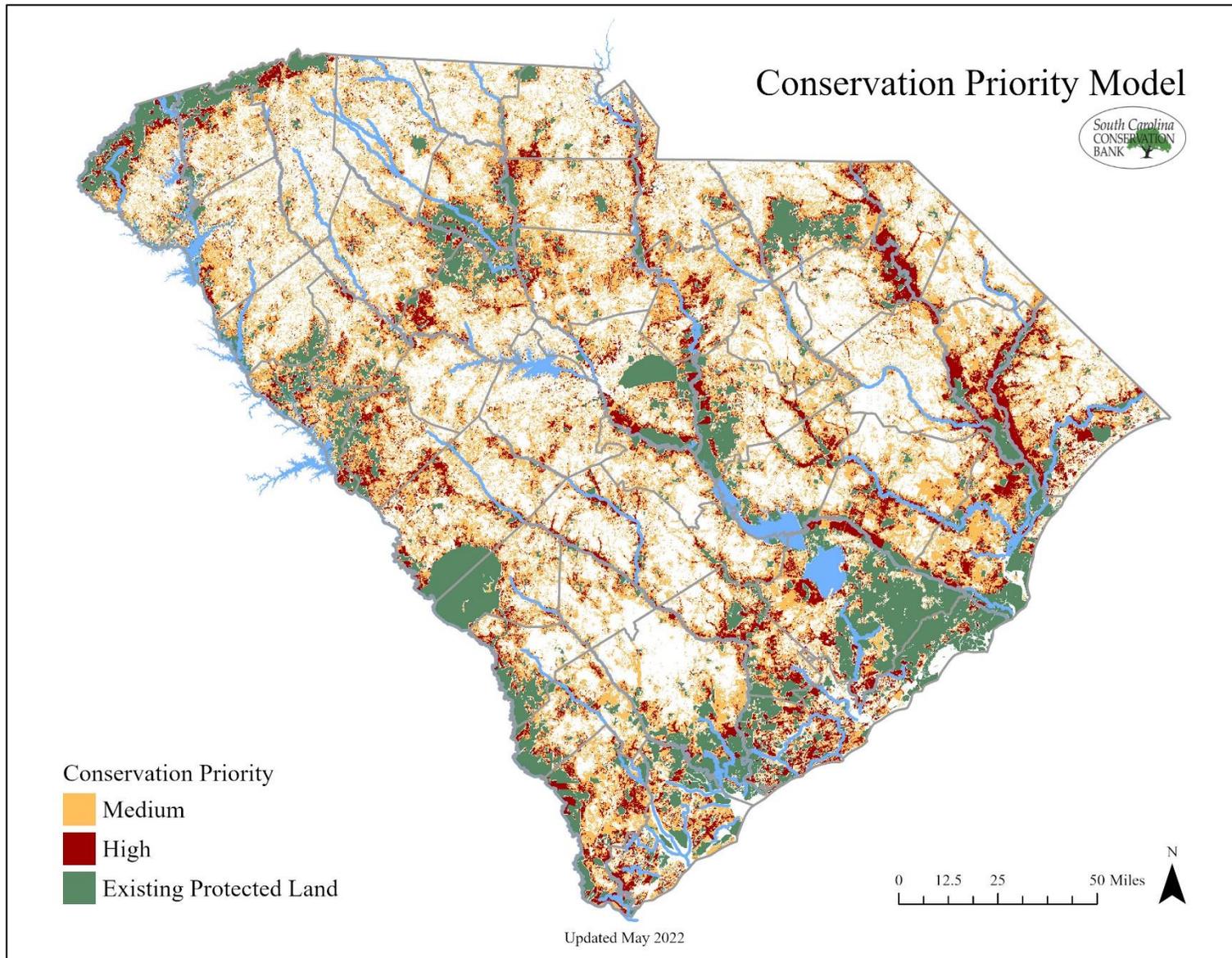
This document outlines the development of the May 2022 statewide conservation priority map. Included in this document are maps and statistics for current conservation conditions in South Carolina, the final statewide conservation priority map, and each of the 6 sub-maps. Finally, each data layer used is documented with how it was ranked for the sub-map.

## **Statewide Conservation Priority Model**

South Carolina's land area is about 20.5 million acres. Currently, approximately 3 million acres of South Carolina's land area is under some form of protection. Approximately 2.5 million acres are developed. Both of these numbers increase annually.

This project has identified **7.9 million acres of South Carolina's landscape as medium priority (5.7 million acres) and high priority (2.2 million acres) for conservation** (Map 1, Statewide Conservation Priority Model), which will help guide the South Carolina Conservation Bank's conservation funding activities. A county-by-county breakdown of conservation priority acreage is found in Appendix A.

**Map 1. Statewide Conservation Priority Model.**



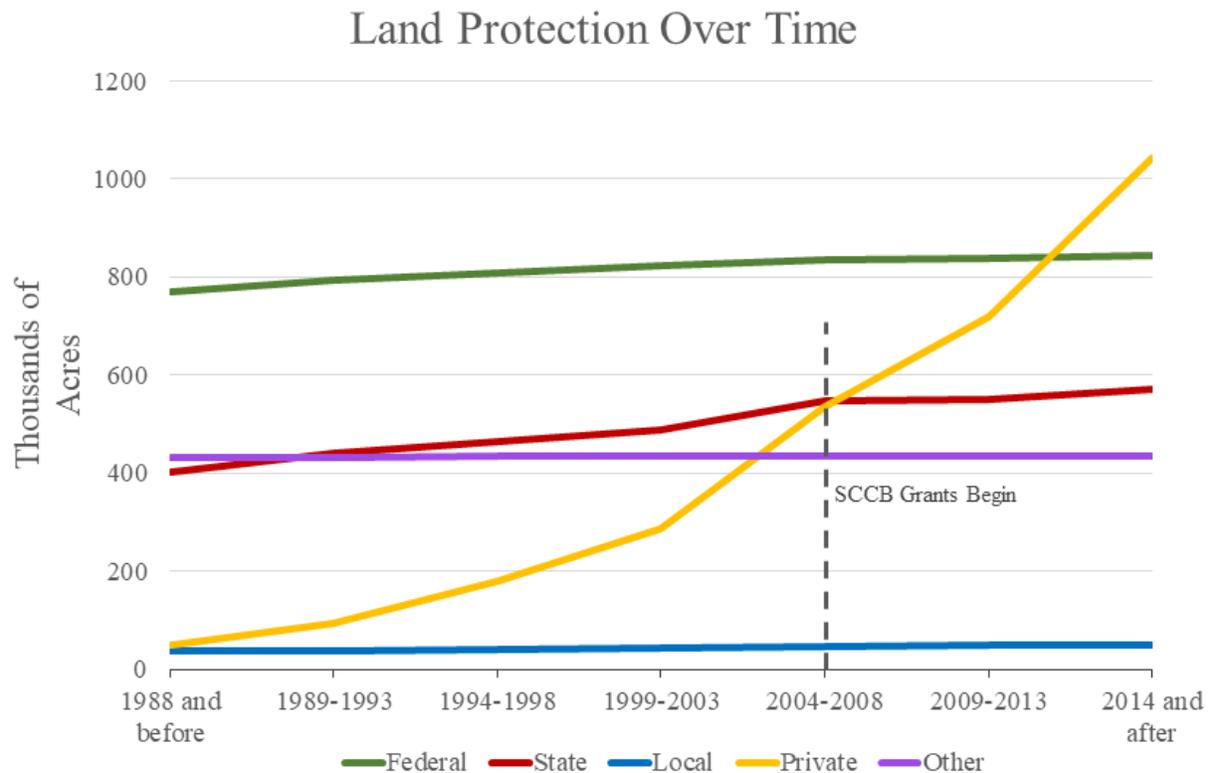
## Current Conservation Conditions

The current status of conservation and land protection in the state provides context for conservation priority mapping and a baseline against which future conservation efforts can be measured.

There are approximately 20.5 million acres of land in South Carolina. Almost 3 million acres are under some form of protection, representing more than 14% of the total land area.

## Land Protection Over Time

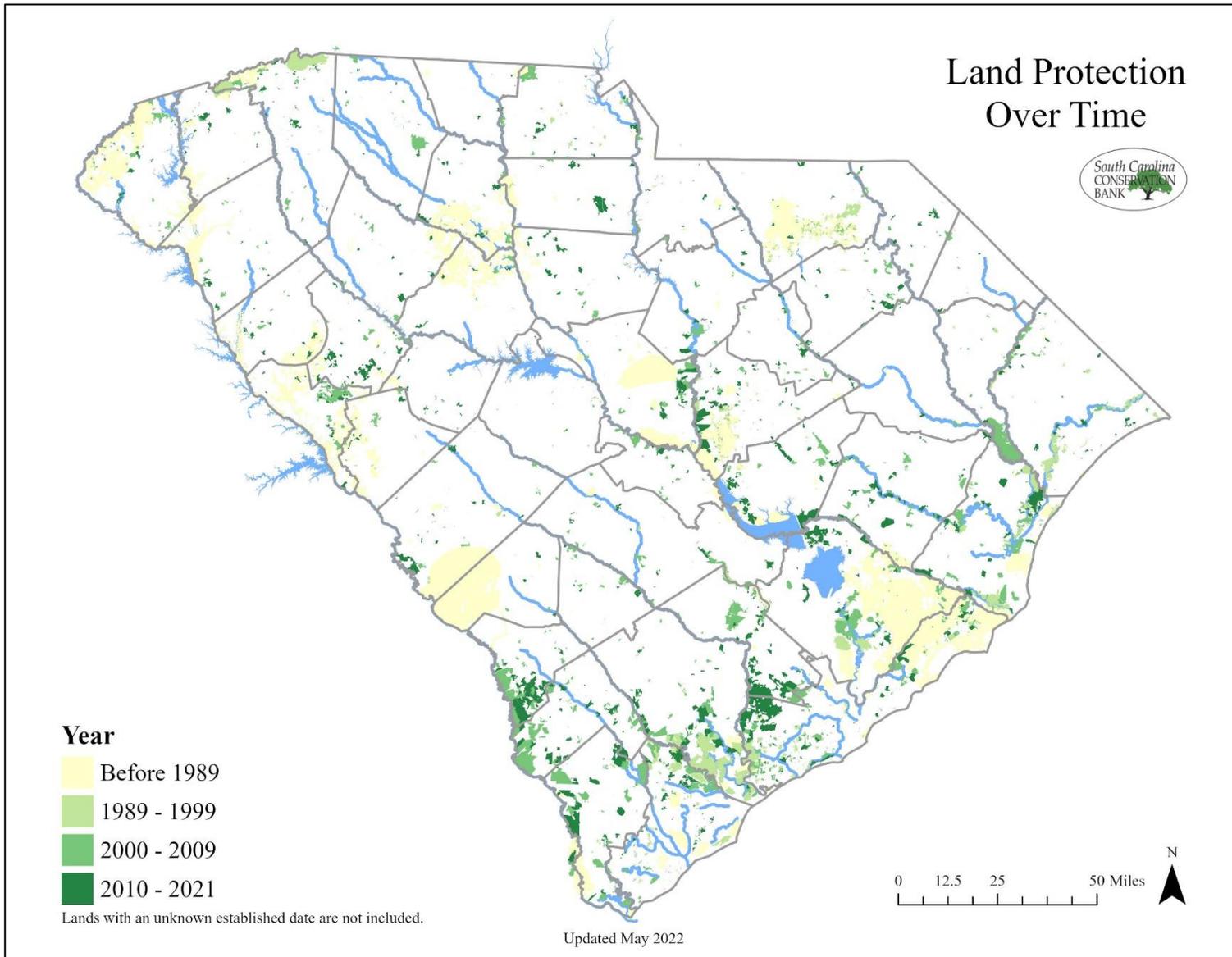
Land protection has increased in the last three decades (Figure 1 and Map 2), with the largest increase in private land protection. Significant increases are also seen in state protected land. The South Carolina Conservation Bank was established in 2002 and began grants for conservation in 2004, bolstering the upward trend of increased conservation acreage.



**Figure 1. Land Protection Over Time\*.[1]**

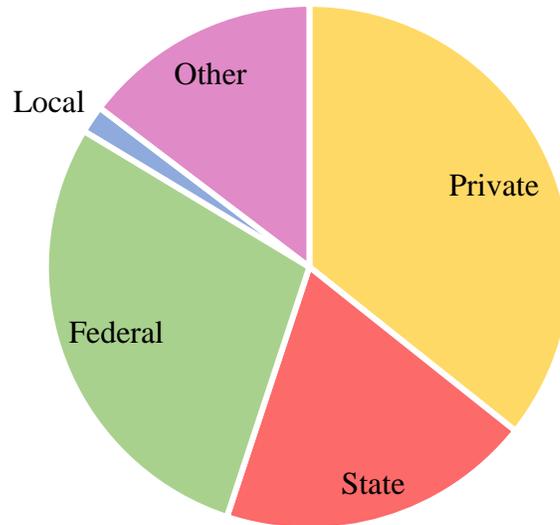
\*The data are from the January 2022 release of The Nature Conservancy’s Protected Lands dataset. The previous report, compiled in 2019, used a prior release of the dataset as well as the USGS Gap Analysis to analyze protected lands which is why results may differ. ‘Other’ protected lands include those owned by the US Department of Energy and US Department of Defense, as well as some lands owned by Clemson University, the US Army Corps of Engineers, and Santee Cooper.

**Map 2. Land Protection Over Time.**



## Current Land Protection by Entity

Protected lands in South Carolina are managed by different entities. Private and state protected lands together contribute to more than half of total protection (Figure 2, Table 1, and Map 3).



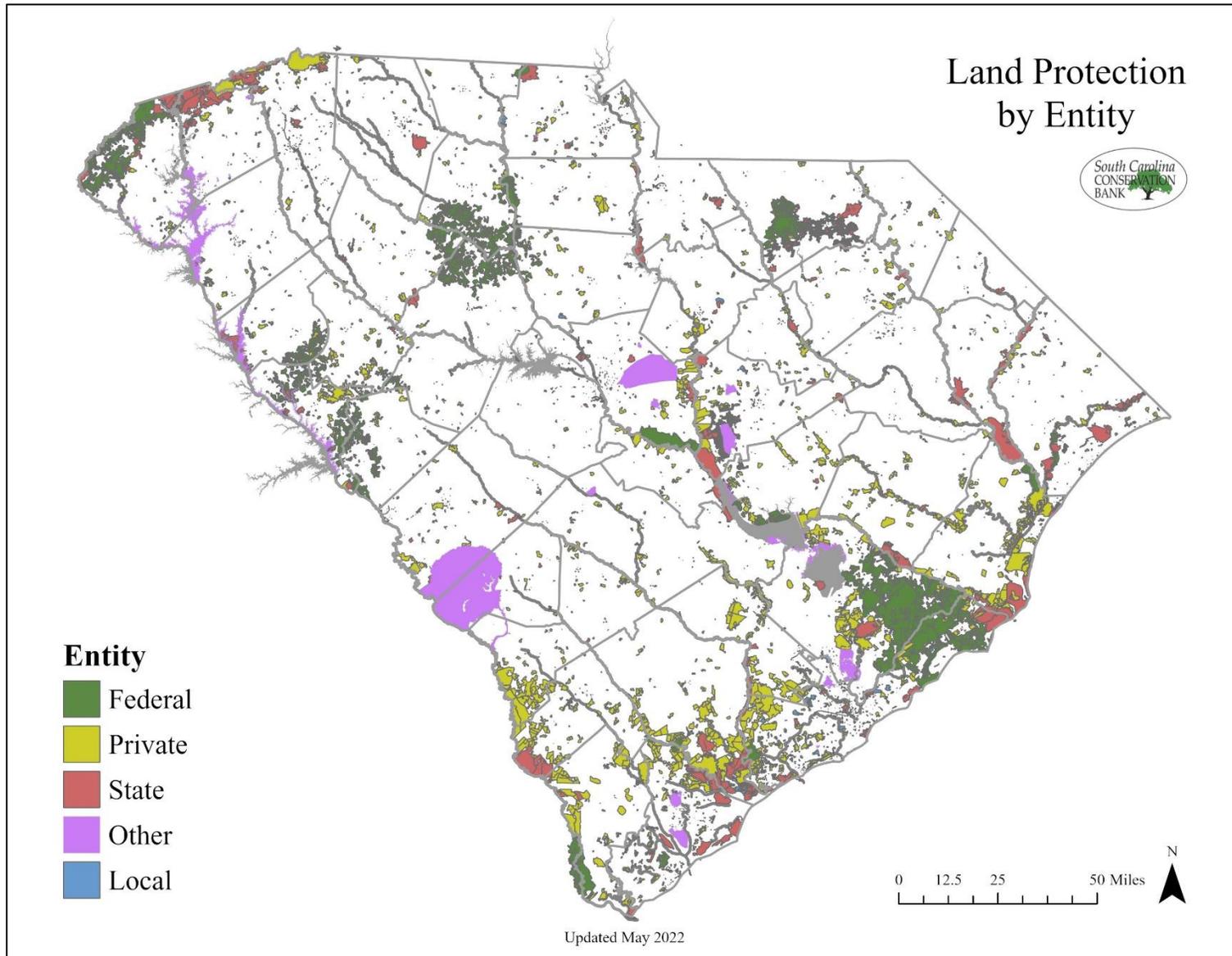
**Figure 2. Land Protection by Entity.<sup>[1]</sup>**

Entity	Acres	% of Protected Acres	% of State Land Area
Federal	844,654	28.6	4.1
Private	1,055,344	35.7	5.2
State	572,501	19.4	2.8
Other	433,239	14.6	2.1
Local	50,149	1.7	0.2
<b>Total</b>	<b>2,955,887</b>	<b>100</b>	<b>14.4</b>

**SC Total Land Area 20,492,800 acres**

**Table 1. Land Protection by Entity, with percentages of protected acres and total state land area.<sup>[1]</sup>**

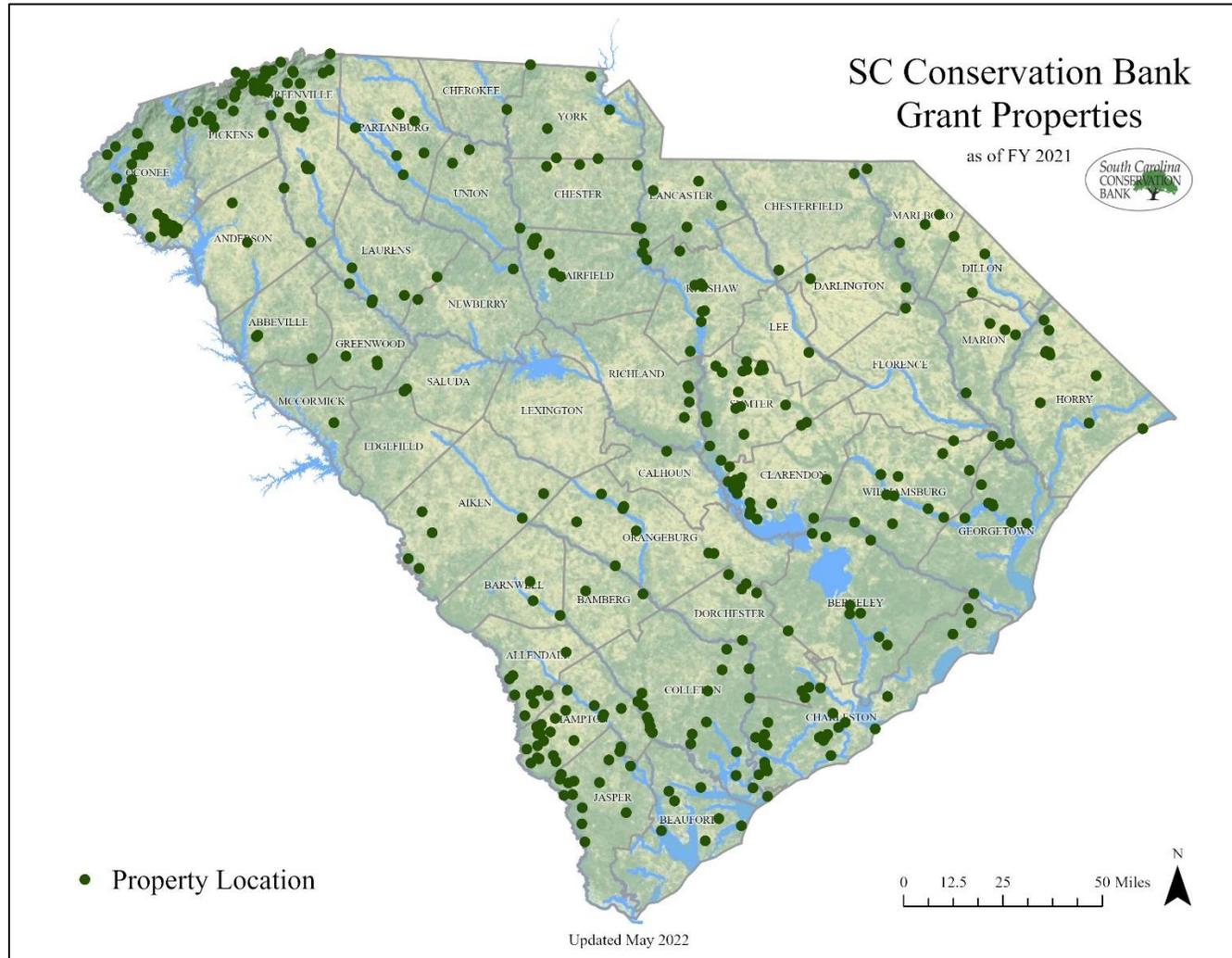
**Map 3. Land Protection by Entity.**



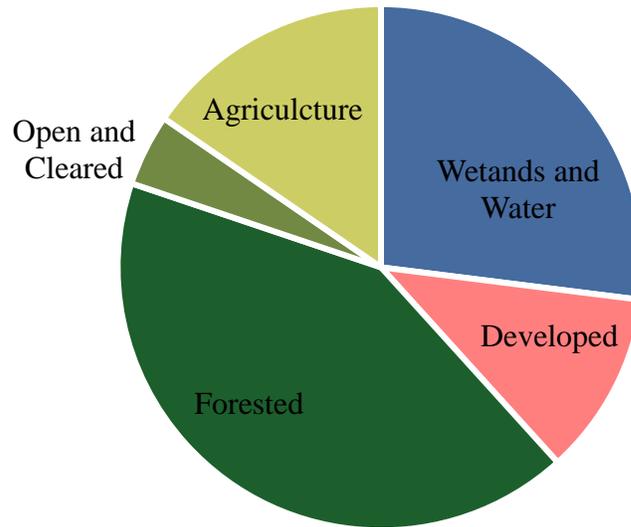
## South Carolina Conservation Bank Projects

As of fiscal year 2022, the South Carolina Conservation Bank has conserved 338,667 acres in the State.

**Map 4. Current South Carolina Conservation Bank Grant Properties.**



## Land Cover Conditions



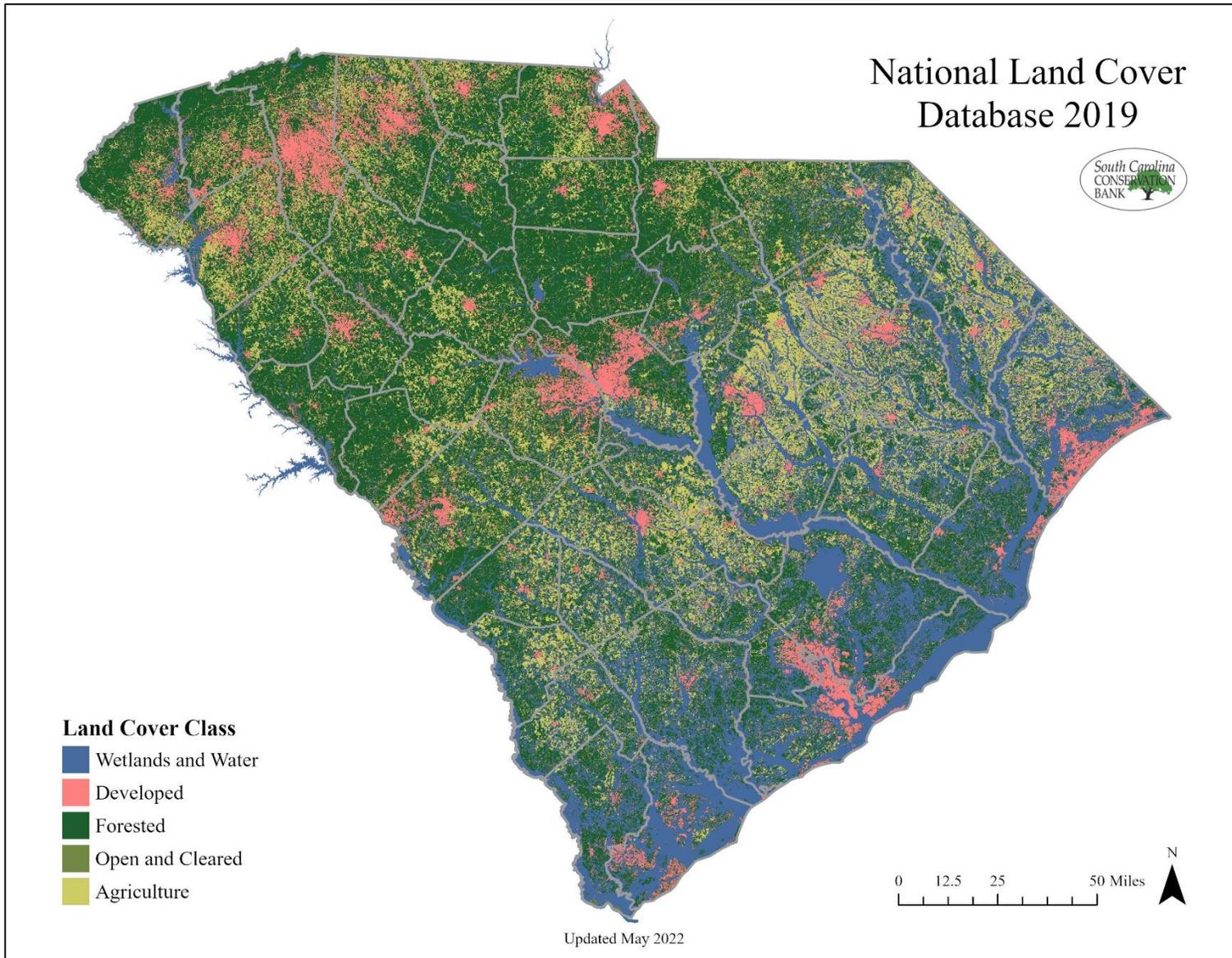
**Figure 3: South Carolina Land Cover, grouped into four basic categories\*.** <sup>[2]</sup>

In reviewing the land cover changes between 2016 and 2019, there are three key trends:

- 1) **Developed land has increased by 26,000 acres.** The percentage of developed land increased from 11.18% to 11.31% of the state's total land area.
- 2) **Forested land has increased 48,000 acres.** The percentage of forested land (of any forest class) has increased from 41.64% to 41.88% of the state's total land area. The forested land increase is seen in deciduous forest and shrub/scrub land, whereas evergreen and mixed forest have decreased.
- 3) **Protected lands increased by 94,000 acres in the same period,** based on the protected lands dataset.

\*The data are from the 2019 release of the National Land Cover Database (NLCD), the latest available data (released June 2021). This data release can be compared to the prior release (2016), and a land cover change index dataset can be reviewed to see where land cover change has occurred over multiple NLCD datasets.

**Map 5. National Land Cover Database.**



## **Current Conservation Conditions References**

1. The Nature Conservancy SC Protected Lands. Accessed May 2022.
2. Multi-Resolution Land Characteristics Consortium - National Land Cover Database 2019. Accessed May 2022.

## **Priority Mapping Data and Methodology**

### **General Methodology**

The statewide conservation priority map was developed using an occurrence modeling method. Best-available datasets representing each sub-map's category were obtained. With guidance from the Technical Advisory Committee (TAC), it was determined how the attributes of each dataset would be ranked. These ranks are outlined in this section of this document. The datasets were processed into raster datasets with values according to their attribute ranking. To generate each sub-map model, the data layers were 'stacked', or summed on a per-pixel basis. The resulting sub-map raster was divided into low, medium, and high priority categories based on Jenks Natural Breaks classification and feedback from the Technical Advisory Committee.

The final summed priority model is a combination of all five sub-maps. Each sub-map model was given a normalized value for their low, medium, and high-ranking pixels. A normalized value was used so that each sub-map model had equal weight in the summed priority model. The normalized sub-map models were summed on a per-pixel basis to produce the summed priority model.

All data were re-projected to NAD83 UTM Zone 17, clipped to the extent of South Carolina, rasterized to 30 meters spatial resolution, snapped to the cell alignment of and masked by the National Land Cover Dataset. The areas that were already under protection were merged with each dataset and assigned a value of 99. Finally, all areas that had no data or were not determined to be priority were assigned a value of 0.

## **Sub-Map 1: Conservation Corridors**

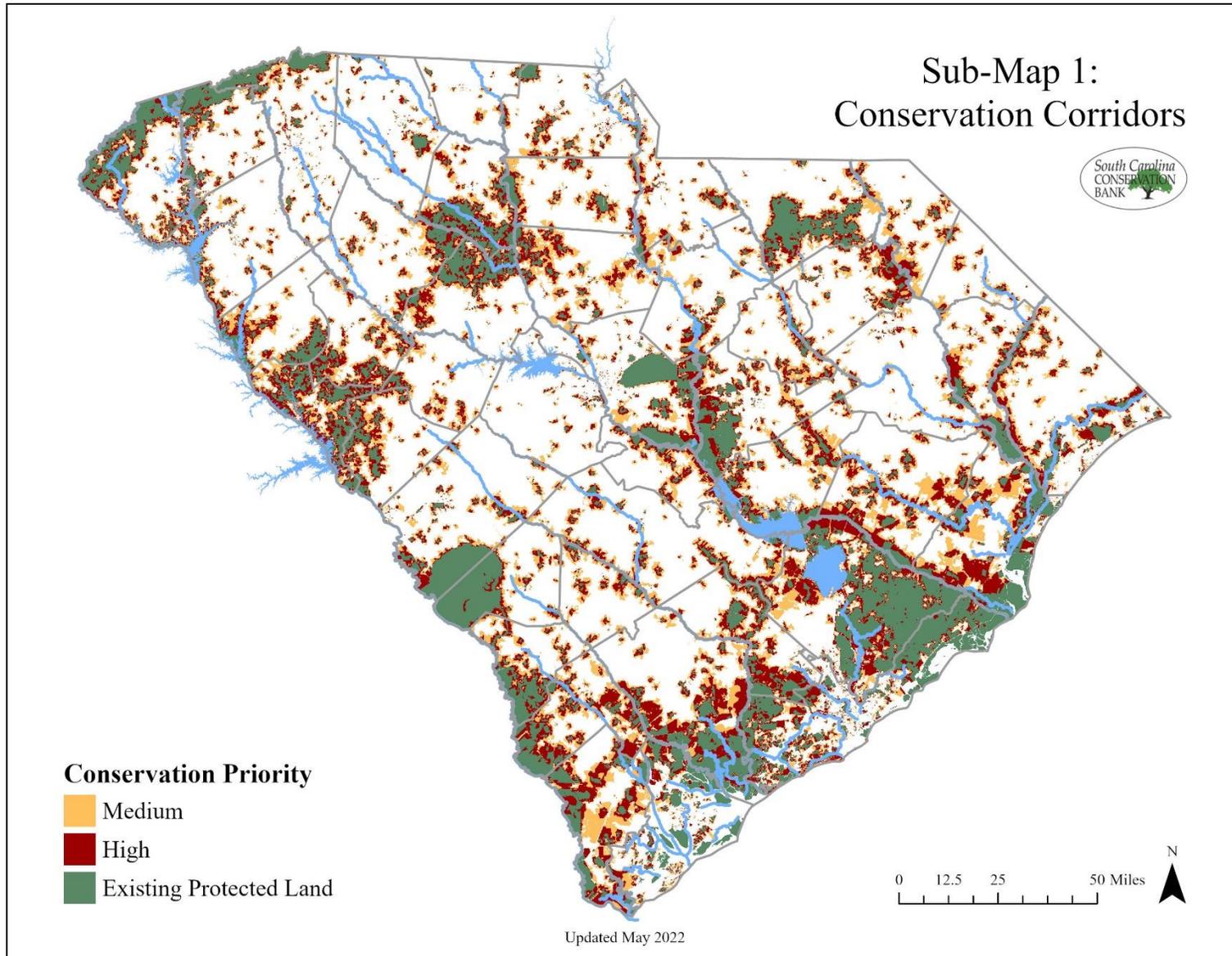
Habitat fragmentation is a major threat to biodiversity. Connectivity facilitates animal movement, seed dispersal, and other ecological processes. Creating corridors of protected land is critical to conservation.

### **Data Layers**

#### Adjacency to Protected Lands

- High: parcels touching existing protected land, and parcels adjacent to parcels that touch existing protected land that are equal to or greater than 500 acres
- Medium: parcels adjacent to parcels that touch existing protected land that are less than 500 acres, and parcels within one mile of existing protected land that are equal to or greater than 500 acres
- Low: parcels within one mile of existing protected land that are less than 500 acres

**Map 6. Sub-Map 1: Conservation Corridors Priority Model.**



## **Sub-Map 2: Ecological Conservation Priorities**

South Carolina faces various ecological challenges. Many species are being driven out from their natural habitat due to invasive species, deforestation, or urbanization. By identifying lands that can support wildlife populations, South Carolina can conserve these lands for natural wildlife. Areas that have existing endangered species also have priority for conservation.

### **Data Layers**

#### Ecological Resiliency

- High: areas categorized as sea level rise area, priority coastal marsh migration space, vulnerable tidal complex, resilient tidal complex, resilient diffuse flow (climate informed), resilient recognized biodiversity, resilient concentrated flow (climate informed)/recognized biodiversity, resilient diffuse flow (climate informed)/recognized biodiversity value, resilient concentrated flow (climate informed), resilient diffuse flow/recognized biodiversity, resilient diffuse flow, and most resilient/far above average terrestrial resilience in TNC's Resilient Coastal Sites and Resilient and Connected Landscapes models
- Medium: areas categorized as mostly resilient/concentrated flow/recognized biodiversity, mostly resilient/concentrated flow, slightly more resilient/slightly above average terrestrial resilience, and more resilient/above average terrestrial resilience in TNC's Resilient Coastal Sites and Resilient and Connected Landscapes models
- Low: areas categorized as high and medium in the SECAS Conservation model that do not overlap with TNC's models

#### State Species of Concern\*

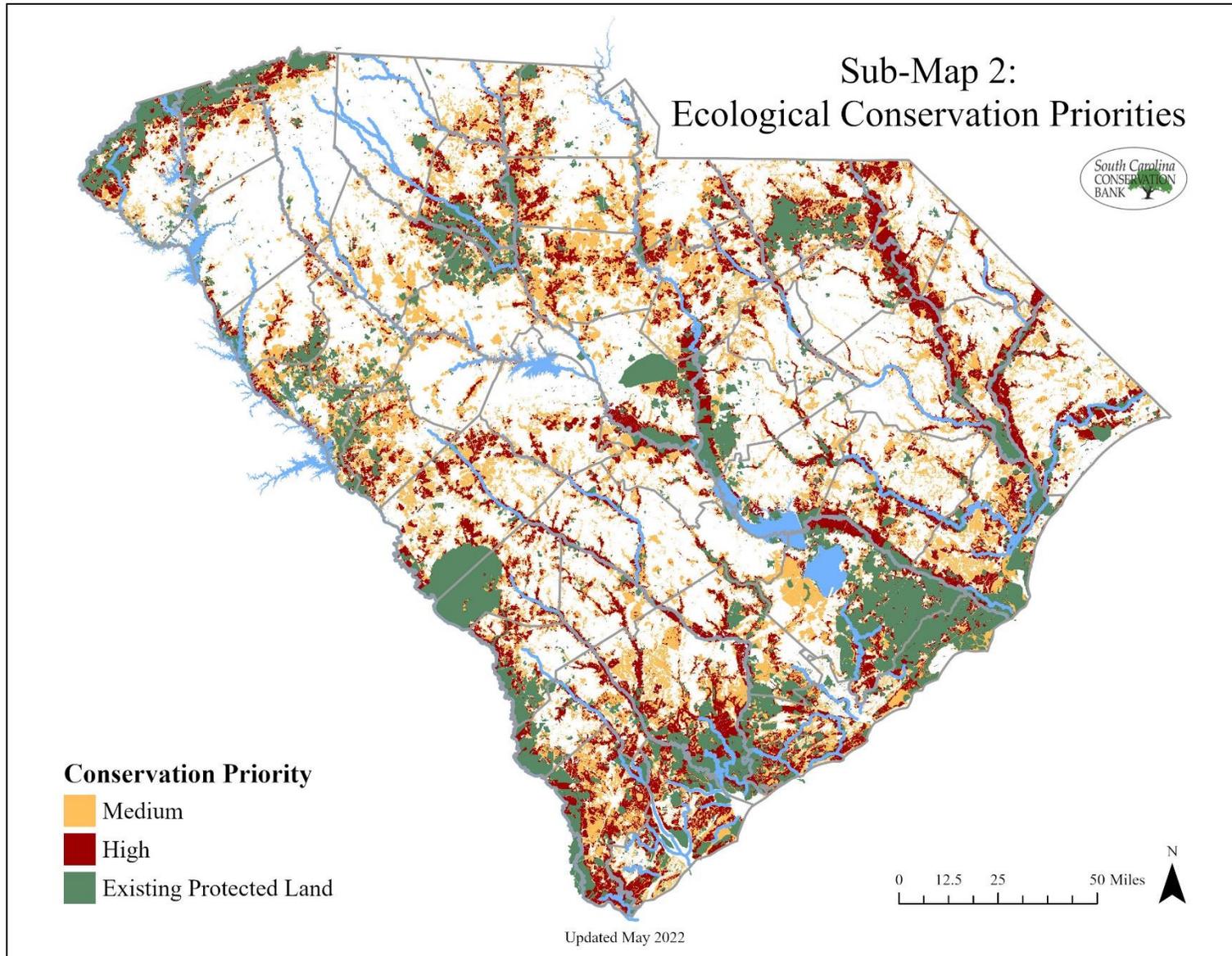
- High: green infrastructure cores that have a core score between 2.8 and 5.0 and contain federal at-risk species, federal/state threatened and endangered species, G1-G3 species, and/or S1-S3 species, and green infrastructure cores that have a core score between 1.9 and 2.7 and contain federal/state threatened and endangered species, G1-G2 species, and/or S1-S2 species
- Medium: green infrastructure cores that have a core score between 2.8 and 5.0 and do not contain federal at-risk species, federal/state threatened and endangered species, G1-G3 species, and/or S1-S3 species, green infrastructure cores that have a core score between 1.9 and 2.7 and contain federal at-risk species, G3 species, and/or S3 species, and green infrastructure cores that have a core score between 1.1 and 1.8 and contain federal/state threatened and endangered species, G1-G2 species and/or S1-S2 species
- Low: green infrastructure cores that have a core score between 1.1 and 2.7 and do not contain federal at-risk species, federal/state threatened and endangered species, G1-G3 species, and/or S1-S3 species, and green infrastructure cores that have a core score between 1.1 and 1.8 and contain federal at-risk species, G3 species, and/or S3 species

\*G1-G3 ranks refer to Global Conservation Status Ranks assigned by NatureServe. S1-S3 ranks refer to State Conservation Status Ranks assigned by state wildlife biologists.

## Grasslands

- High: n/a
- Medium: n/a
- Low: Bobwhite Quail Conservation Initiative areas categorized as biologist rank high or medium that are within NLCD shrub/scrub and herbaceous/grassland areas

**Map 7. Sub-Map 2: Ecological Conservation Priorities Priority Model.**



### **Sub-Map 3: Sustainable Forestry and Agriculture**

With the population of South Carolina growing, the demand for food and forest products also continues to grow. The conservation of agricultural and forest resources needs to be identified to meet future demands.

#### **Data Layers**

##### Distance to Mills

- High: areas that have a value 100 score of 68 or greater
- Medium: areas that have a value 100 score between 52 and 67
- Low: areas that have a value 100 score between 32 and 51

##### Managed Timber

- High: all areas categorized as evergreen plantation or managed pine, harvest forest – grass/forb regeneration, and/or harvest forest – shrub regeneration
- Medium: NA
- Low: NA

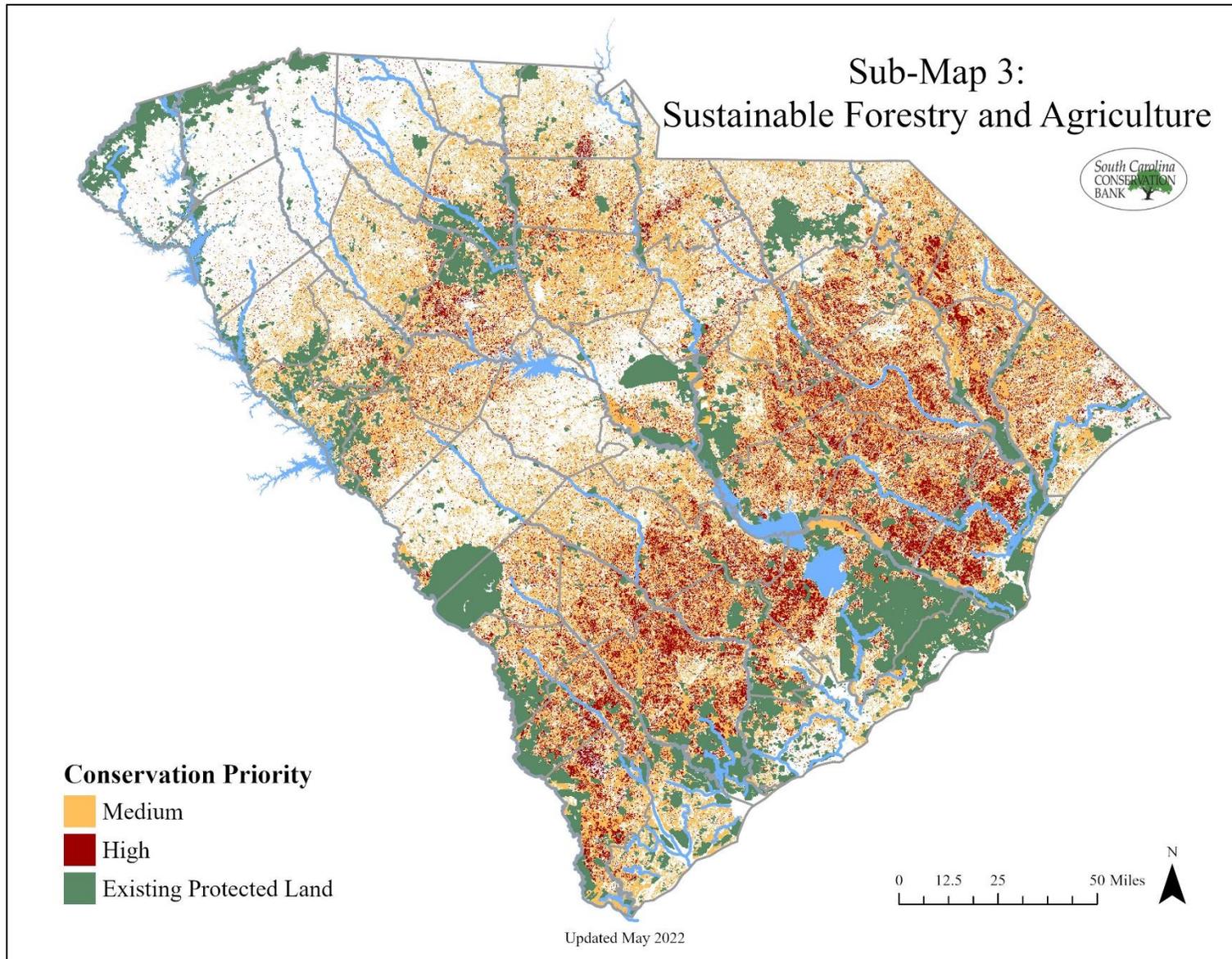
##### Soil Drainage

- High: areas that have a DI value between 79 to 99
- Medium: areas that have a DI value between 60 to 78
- Low: areas that have a DI value between 45 to 59

##### Productivity, Versatility, and Resiliency of Agricultural Lands

- High: productivity, versatility, and resiliency of agricultural land areas that overlap with prime farmland soil areas and are categorized as greater than 0.6
- Medium: productivity, versatility, and resiliency of agricultural land areas that overlap with prime farmland soil areas and are categorized as greater than 0.3
- Low: all other productivity, versatility, and resiliency of agricultural land areas and prime farmland soil areas

**Map 8. Sub-Map 3: Sustainable Forestry and Agriculture Priority Model.**



## **Sub-Map 4: Water Resources**

As the population of South Carolina continues to grow, the state needs to plan for future water needs. Water is a critical resource, both for the ecosystem and the developed landscape. By identifying areas of the state that have water resources impact, South Carolina conservation efforts can contribute to protection of and smart use of water resources.

### **Data Layers**

#### Forests to Faucets

- High: areas that have IMP\_R values between 83 and 100, and/or APCW\_R values between 80 and 100
- Medium: areas that have IMP\_R values between 66 and 82, and/or APCW\_R values between 58 and 79
- Low: areas that have IMP\_R values between 40 and 65, and/or APCW\_R values between 48 and 57

#### Flood-focused Priority Conservation Model

- High: all flood focused priority conservation areas
- Medium: n/a
- Low: n/a

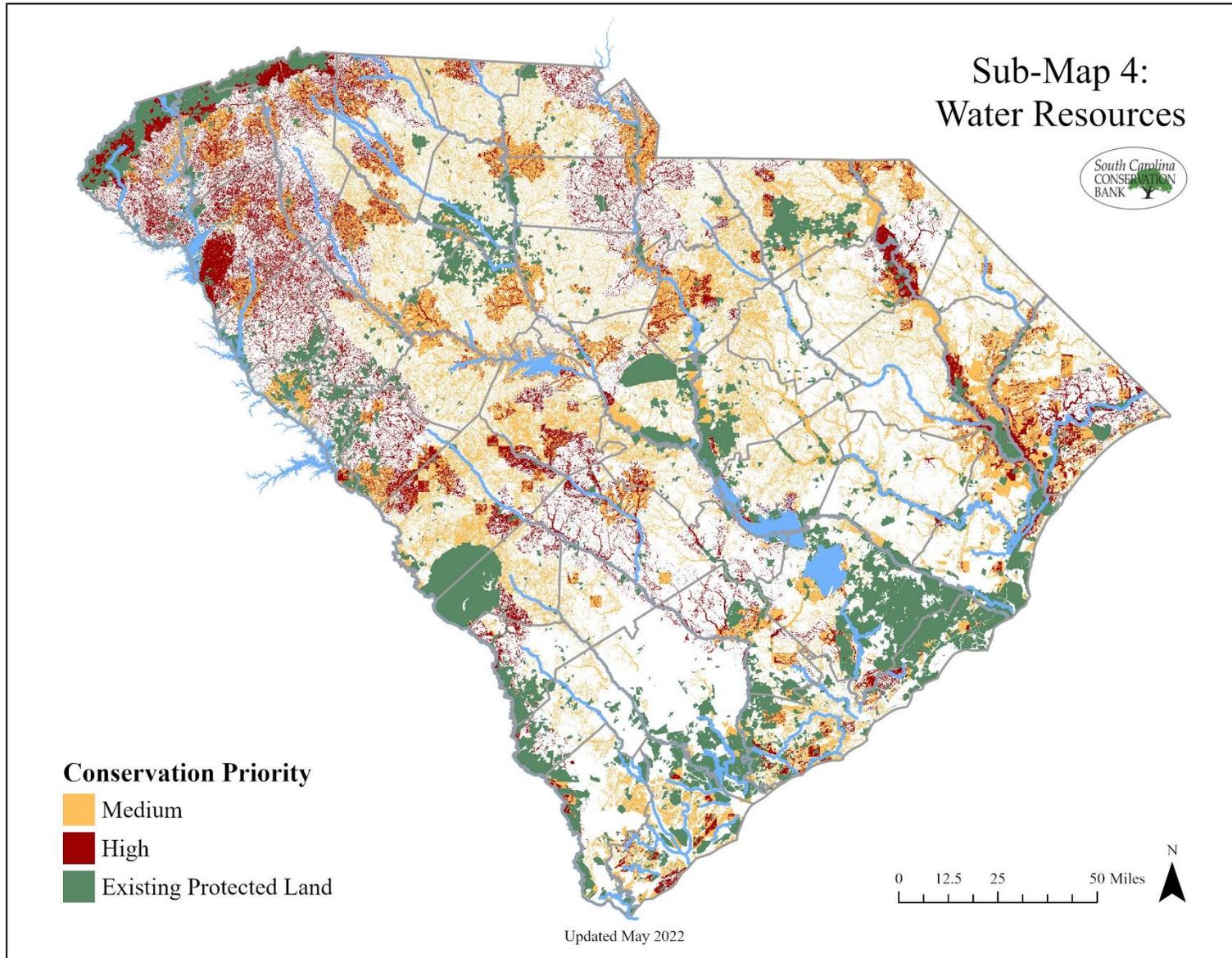
#### Water Quality Protection

- High: two or three of the following are true for a 30x30 raster cell area- has higher than one standard deviation above the mean recharge (greater than 10.158), is within a parcel that intersects with a source water protection area and/or a groundwater protection zone, and/or is within a parcel that intersects with an outstanding resource water
- Medium: one of the following is true for a 30x30 raster cell area- has higher than one standard deviation above the mean recharge (greater than 10.158), is within a parcel that intersects with a source water protection area and/or a groundwater protection zone, or is within a parcel that intersects with an outstanding resource water

#### Trout Catchments

- High: all parcels that intersect with brook trout stream catchments
- Medium: n/a
- Low: n/a

**Map 9. Sub-Map 4: Water Resources Priority Model.**



## **Sub-Map 5: Proximity to Urban Interface**

Creating conservation areas near people provides opportunities for cleaner water and air and parks, however, urbanization is the main threat to conservation as it consumes land and fragments landscapes. Working to create a balance between these two things is a key part of conservation.

### **Data Layers**

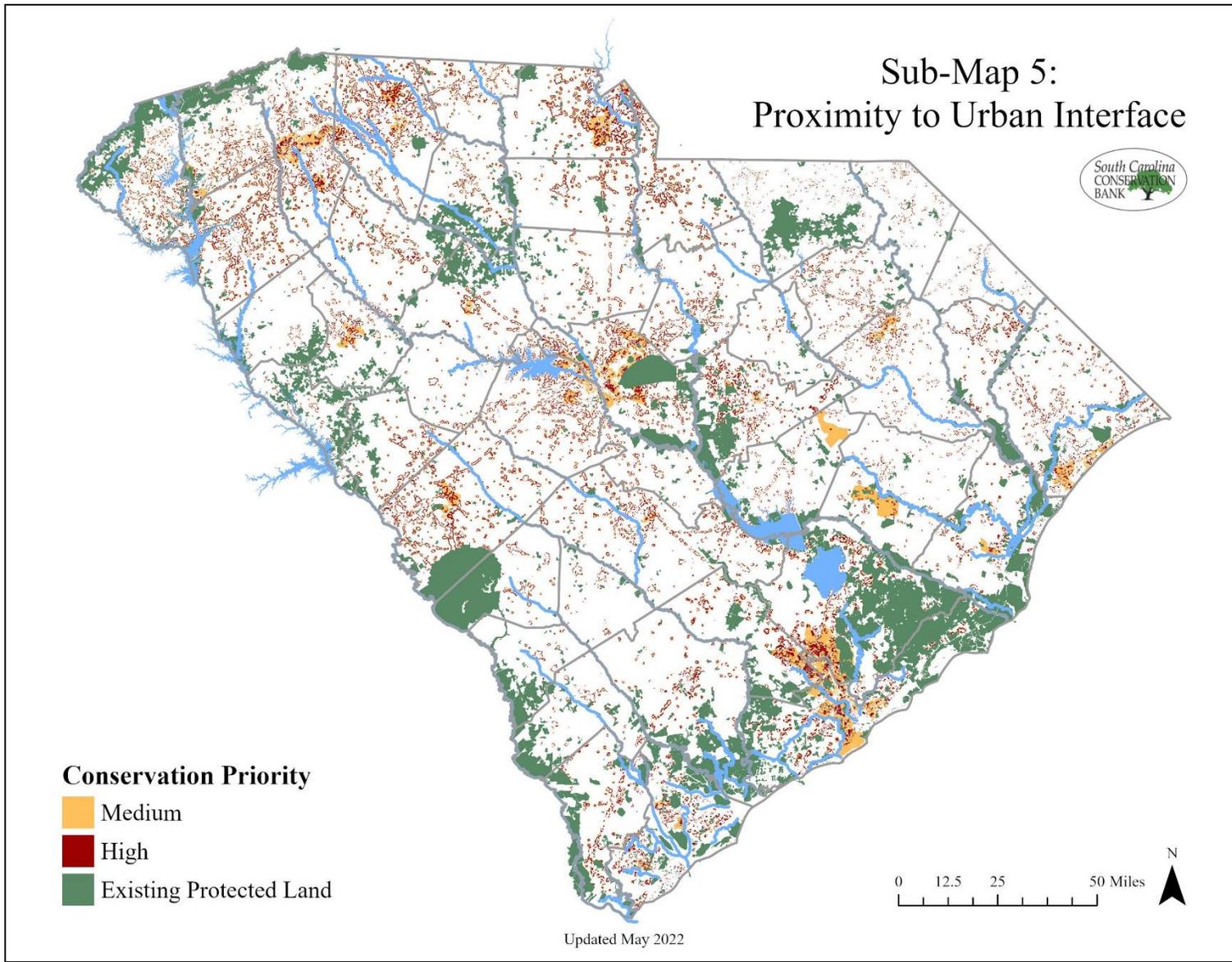
#### Potential of Urbanization

- High: areas with a 50% chance of urbanization by 2030
- Medium: areas with a 50% chance of urbanization by 2040
- Low: areas with a 50% chance of urbanization by 2050

#### Proximity to People

- High: block groups that have a population one standard deviation above South Carolina's mean
- Medium: block groups adjacent to high block groups
- Low: block groups that are within one mile of high block groups

**Map 10. Sub-Map 5: Proximity to Urban Interface Priority Model.**



## **Sub-Map 6: Public Benefit**

The public can benefit from conservation through public access opportunities. Likewise, areas adjacent to main roads, boat ramps, and large public trails are more easily accessible and provide benefit to the public.

### **Data Layers**

#### Scenic Vistas - Roads

- High: areas adjacent to scenic byways
- Medium: areas adjacent to a United States or South Carolina route
- Low: areas adjacent to an interstate

#### Scenic Vistas - Waterways

- High: areas adjacent to scenic rivers
- Medium: forested areas adjacent to a waterway within 2 miles of a public boat ramp
- Low: forested areas adjacent to a waterway within 10 miles of a public boat ramp

#### Public Trails

- High: areas adjacent to a trail
- Medium: n/a
- Low: n/a

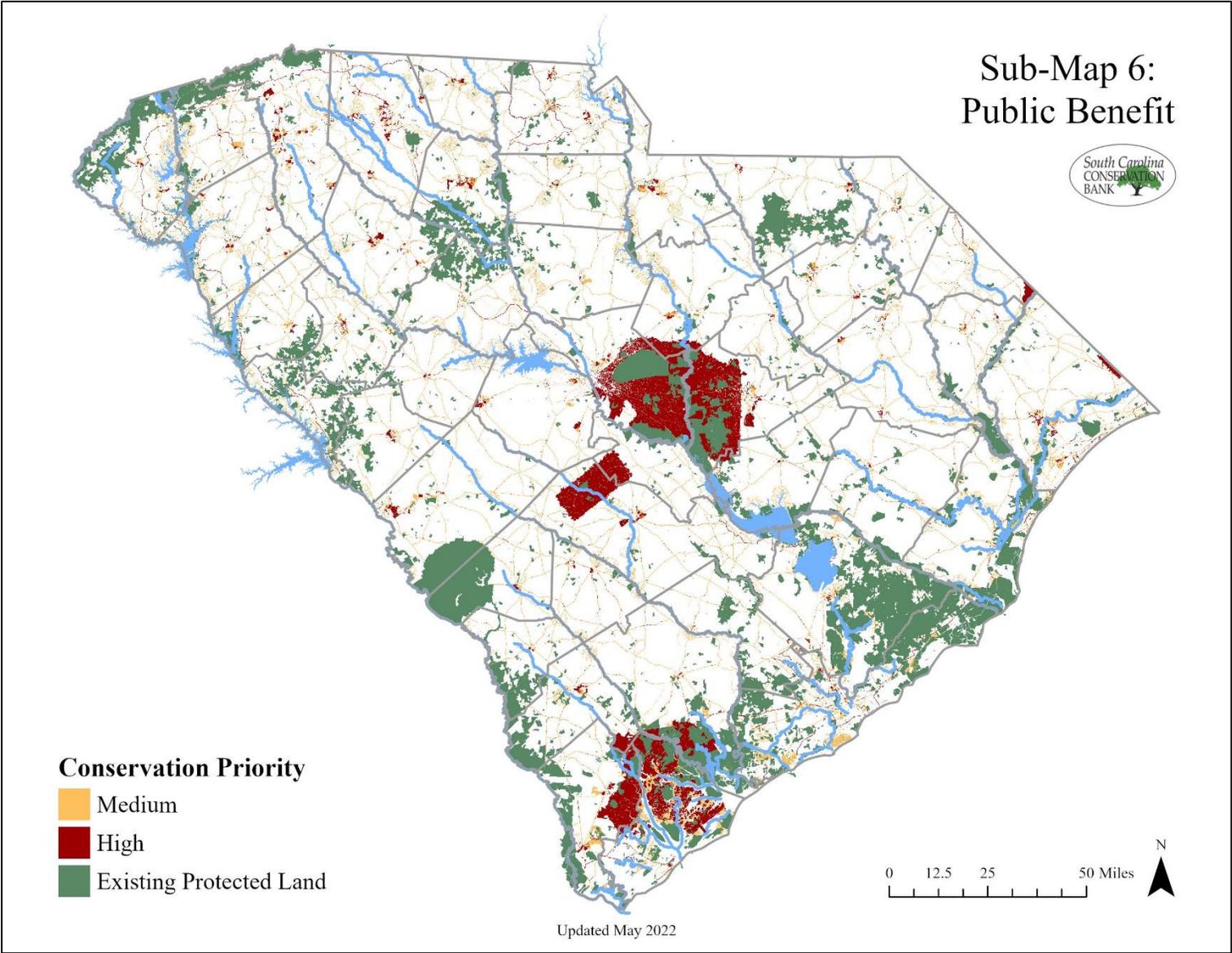
#### Important Lands for the Military

- High: parcels within REPI Partnership Opportunity Areas
- Medium: n/a
- Low: n/a

#### Equitable Access to Potential Parks

- High: areas categorized as very high priority for a new park that would create nearby equitable access
- Medium: areas categorized as high priority for a new park that would create nearby equitable access
- Low: areas categorized as moderate priority for a new park that would create nearby equitable access

**Map 11. Sub-Map 6: Public Benefit Priority Model.**



## **Priority Mapping Data and Methodology References**

### **Sub-Map 1: Conservation Corridors**

#### Adjacency to Protected Lands

- The Nature Conservancy's SC Protected Lands
- Parcel Data - Accessed via individual county

### **Sub-Map 2: Ecological Conservation Priorities**

#### Ecological Resiliency

- The Nature Conservancy's Resilient Coastal Sites
- The Nature Conservancy's Resilient and Connected Landscapes
- Southeast Conservation Adaptation Strategy (SECAS)'s Southeast Conservation Blueprint

#### State Species of Concern

- South Carolina Natural Heritage Program's Element Occurrence Data
- Green Infrastructure Center Inc.'s Habitat Cores

#### Grasslands

- Multi-Resolution Land Characteristics Consortium - National Land Cover Database 2019's Grasslands
- National Bobwhite & Grassland Initiative's National Bobwhite Conservation Initiative 2.0

### **Sub-Map 3: Sustainable Forestry and Agriculture**

#### Distance to Mills

- South Carolina Forestry Commission's Proximity to Mills

#### Managed Timber

- United States Geological Surveys – GAP/LANDFIRE National Terrestrial Ecosystems' Managed Timber

#### Soil Drainage

- United States Department of Agriculture - Forest Service's Soil Drainage

#### Productivity, Versatility, and Resiliency of Agricultural Lands

- American Farmland Trust's Productivity, Versatility, and Resiliency of Agricultural Lands
- National Resources Conservation Service's Prime Farmland Soils

### **Sub-Map 4: Water Resources**

#### Forests to Faucets

- United States Department of Agriculture - Forest Service's National Forests to Faucets

#### Flood-focused Priority Conservation Model

- South Carolina Office of Resilience's Flood-focused Priority Conservation Model

#### Water Quality Protection

- United States Geological Survey Soil-water Balance 1979-2016 and South Carolina Department of Health and Environmental Control's High Modeled Potential Recharge Areas
- South Carolina Department of Health and Environmental Control's Source Water Protection Areas
- South Carolina Department of Health and Environmental Control's Groundwater Protection Zones
- South Carolina Department of Health and Environmental Control's Outstanding Resource Waters

#### Trout Catchments

- South Carolina Department of Natural Resource's Trout Stream Catchments

### **Sub-Map 5: Proximity to Urban Interface**

#### Potential of Urbanization

- Dr. Keith Clarke (UC-Santa Barbara)'s SLEUTH Model

#### Proximity to People

- United States Census Bureau's 2010 Census Block Boundaries

### **Sub-Map 6: Public Benefit**

#### Scenic Vistas - Roads

- South Carolina Department of Transportation's Statewide Highways
- South Carolina Department of Transportation's Scenic Byways

#### Scenic Vistas – Waterways

- United States Environmental Protection Agency's National Hydrography Dataset
- Multi-Resolution Land Characteristics Consortium - National Land Cover Database 2019's Deciduous, Evergreen, Mixed Forest and Woody Wetlands
- South Carolina Department of Natural Resource's Scenic Rivers

#### Public Trails

- East Coast Greenway Alliance's East Coast Greenway

- Rails-to-Trails Conservancy's Rails to Trails
- Palmetto Conservation Foundation's Palmetto Trail

#### Important Lands for the Military

- United States Department of Defense's Readiness and Environmental Protection Integration Partnership Opportunity Areas

#### Equitable Access to Potential Parks

- Southeast Conservation Adaptation Strategy (SECAS)'s Equitable Access to Potential Parks

**Appendix A - Table of Conservation Priority Area by County**

County	County Total Acres	Medium and High Priority Conservation Acres	% County Area	Current Protected Acres	% County Area	All Developed Land Cover Acres	% County Area
Abbeville	326,960	95,649	29	56,724	17	23,307	7
Aiken	693,576	308,415	44	96,664	14	83,149	12
Allendale	263,543	94,671	36	61,817	23	12,585	5
Anderson	484,461	173,476	36	46,157	10	98,300	20
Bamberg	252,915	89,219	35	8,957	4	15,862	6
Barnwell	356,442	119,585	34	121,121	34	22,230	6
Beaufort	484,990	197,429	41	103,457	21	62,553	13
Berkeley	786,116	256,181	33	317,772	40	76,220	10
Calhoun	251,100	100,797	40	19,576	8	17,500	7
Charleston	687,396	225,814	33	254,499	37	101,590	15
Cherokee	253,853	69,614	27	4,562	2	34,523	14
Chester	374,777	167,576	45	26,136	7	24,865	7
Chesterfield	515,729	174,210	34	104,843	20	41,252	8
Clarendon	444,578	151,073	34	54,581	12	28,319	6
Colleton	695,980	204,366	29	130,660	19	34,965	5
Darlington	362,129	120,227	33	19,907	5	39,043	11
Dillon	260,205	77,568	30	4,280	2	21,336	8
Dorchester	366,470	177,547	48	63,322	17	43,872	12
Edgefield	322,732	181,285	56	39,652	12	22,484	7
Fairfield	453,960	236,427	52	23,771	5	23,590	5
Florence	514,484	173,323	34	7,112	1	62,356	12
Georgetown	558,655	297,902	53	137,266	25	44,972	8
Greenville	508,289	156,030	31	63,861	13	156,375	31
Greenwood	296,218	136,653	46	30,901	10	37,149	13
Hampton	360,238	152,438	42	70,548	20	18,955	5
Horry	733,365	339,618	46	59,016	8	127,316	17
Jasper	428,847	234,245	55	84,189	20	22,274	5
Kershaw	473,910	268,167	57	18,352	4	44,201	9
Lancaster	354,234	154,636	44	13,470	4	39,696	11
Laurens	463,067	196,633	42	33,012	7	47,218	10
Lee	263,139	94,785	36	13,489	5	16,908	6
Lexington	485,409	151,535	31	4,144	1	112,200	23
Marion	316,143	178,526	56	42,992	14	24,636	8
Marlboro	310,385	148,992	48	8,588	3	21,757	7
McCormick	251,649	109,130	43	97,083	39	15,150	6
Newberry	413,967	183,415	44	68,470	17	30,585	7
Oconee	431,378	141,813	33	132,409	31	57,567	13

Orangeburg	720,714	260,952	36	30,290	4	65,462	9
Pickens	327,406	117,145	36	59,326	18	56,471	17
Richland	493,975	183,039	37	113,419	23	113,403	23
Saluda	293,546	94,553	32	8,336	3	20,101	7
Spartanburg	524,129	168,463	32	13,510	3	132,548	25
Sumter	436,329	175,492	40	97,689	22	51,312	12
Union	330,066	142,339	43	74,521	23	21,015	6
Williamsburg	599,179	288,504	48	45,326	8	33,538	6
York	444,963	149,253	34	25,766	6	85,931	19
<b>TOTALS*</b>	<b>19,971,591</b>	<b>7,918,708</b>		<b>2,911,544</b>		<b>2,286,639</b>	

\*These totals do not include acreage from open water, so the numbers may be slightly less than the total area given elsewhere.